CLAIMS

1. Circuitry for generating a sequence of probable symbols from a sequence of received symbols using Reduced State Sequence Estimation, comprising:

butterfly circuitry for computing terms in butterfly structure of $sm_1' = \min\{sm_1 + m, sm_2 - m\}$ and $sm_2' = \min\{sm_1 - m, sm_2 + m\}$; and

circuitry for computing multiple path metrics between a first state and a second state responsive to the received symbols and reference constellation symbols and determining a best scenario at the second state using said butterfly circuitry.

2. The circuitry of claim 1 and further comprising circuitry for rotating said received symbols by a predetermined angle.

3. The circuitry of claim 1 and further comprising circuitry for rotating said reference constellation symbols by a predetermined angle.

4. The circuitry of claims 2 and 3 wherein said predetermined angle is $(2k+1)*\pi/8$ with k being an whole number.

5. The circuitry of claim 1 and wherein said reference constellation is an 8-PSK constellation, circuitry for expressing axis symbols of the constellation as a function of diagonal symbols in order to assure symmetrical properties for use of the butterfly circuitry.

6. A method of generating a sequence of probable symbols from a sequence of received symbols using Reduced State Sequence Estimation, comprising the steps of:

computing multiple path metrics between a first state and a second state responsive to said sequence of received symbols using a butterfly structure of $sm_1' = \min\{sm_1 + m, sm_2 - m\}$ and $sm_2' = \min\{sm_1 - m, sm_2 + m\}$; and

determining a best scenario at the second state using said butterfly structure.

7. The method of claim 6 and further comprising the step of rotating said received symbols by a predetermined angle.

8. The method of claim 6 and further comprising the step of rotating said reference constellation symbols by a predetermined angle.

9. The method of claims 7 and 8 wherein said predetermined angle is $(2k+1)*\pi/8$ with k being a whole number.

10. The method of claim 6 wherein the reference constellation is an 8-PSK constellation, and further comprising the step of expressing axis symbols of the constellation as a function of diagonal symbols in order to assure symmetrical properties for use of the butterfly circuitry.